

Minimally invasive aortic valve replacement

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Calcifying aortic stenosis is the most common heart valve disease and important cause of cardiovascular morbidity and mortality. The gold standard for treatment of aortic stenosis is surgical replacement of the aortic valve through sternotomy. A minimally invasive approach through an upper ministernotomy, results in a reduction of perioperative complications, especially in obese patients, including less postoperative drainage, a lower frequency of postoperative atrial fibrillation, reduces the number of days patient stays in the intensive care unit, faster recovery, easier verticalization, and ultimately faster discharge from the hospital.

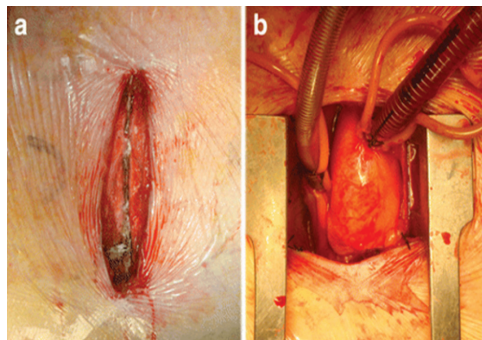


FIGURE 1. Upper ministernotomy.

Upper ministernotomy can be performed through the 3rd or 4th intercostal space, and the skin incision, in our institution, measures 6-10 cm on average. (Figure 1). In the early postoperative course, with the application of intercostal block due to minor pain, it was possible to quickly separate the patient from the machine for mechanical ventilation (extubation) and place the patient in a semi-sitting position. On the first postoperative day, if the drainage is below 200 mL, the patients are transferred to the Department of Cardiac Surgery and verticalized on the same day. Due to the smaller wound, the possibility of developing infection is reduced, especially in the lower part (xiphoid) where infections occur most often. In our institution, aortic valve replacement through ministernotomy is amounted to 14% of the total number of classical surgical aortic valve replacement over the last 5 years (Figure 2). The goal of minimally invasive surgery is to preserve the integrity of the sternum, which leads to a reduction of postoperative complications. But we must also mention the shortcomings. Reduced visualization of the surgical field and the valve, may result in the implantation of a suboptimal prosthetic size and increased rate of paravalvular regurgitation.^{1,2}

The minimally invasive approach represents a significant benefit for the postoperative recovery of the patient and therefore it should become the standard for aortic valve operations.

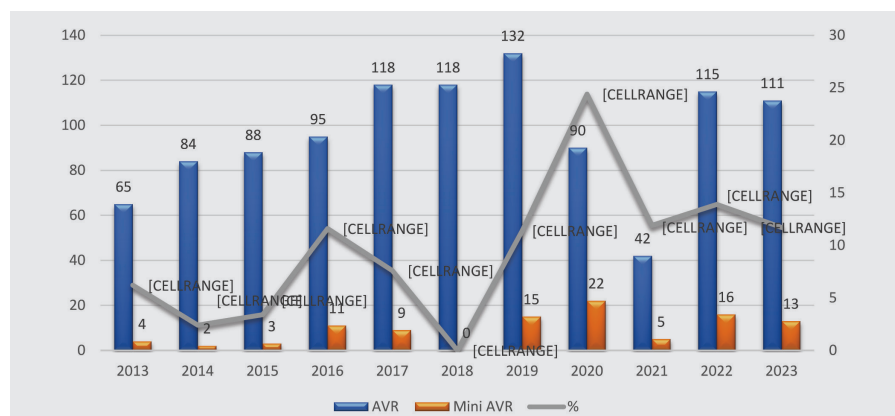


FIGURE 2. Comparison of aortic valve replacements and minimally invasive aortic valve replacement with patient percentage by year.

AVR = aortic valve replacements; Mini AVR = minimally invasive aortic valve replacement

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LITERATURE

- Hancock HC, Maier RH, Kasim A, Mason J, Murphy G, Goodwin A et al. Mini-sternotomy versus conventional sternotomy for aortic valve replacement: a randomised controlled trial. *BMJ Open.* 2021 Jan 29;11(1):e041398. <https://doi.org/10.1136/bmjopen-2020-041398>
- Kirmani BH, Akowuah E. Minimal Access Aortic Valve Surgery. *J Cardiovasc Dev Dis.* 2023 Jun 30;10(7):281. <https://doi.org/10.3390/jcdd10070281>